

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP	NUMBER HP-75300
	REVISION Final Rev0
	DATE 08/05/08
	PAGE 1 of 10
Subject: Flammable Storage Cabinet Inspections	

Contents

- 1.0 Purpose/Scope**
- 2.0 Responsibilities**
- 3.0 Definitions**
- 4.0 Prerequisites**
- 5.0 Precautions**
- 6.0 Procedure**
- 7.0 Implementation and Training**
- 8.0 References**
- 9.0 Attachment**
- 10.0 Documentation**



1.0 Purpose/Scope

This procedure provides a standardized method for Inspection of Flammable Storage Cabinets. It should be used in conjunction with the SBMS Subject Area [*Working with Chemicals*](#). This procedure specifies the applicable chemical storage requirements.

Flammable cabinet storage inspection may present hazardous exposure to chemicals. This procedure documents the safety measures to ensure the personnel performing the inspection are not exposed to undue risk of exposure to chemicals while performing inspections.

2.0 Responsibilities

- 2.1 Use of the procedure is to be limited to persons who have demonstrated the competency on the procedures and its safety measures, as evidenced by the qualification criteria set in Section 7.
- 2.2 Personnel that perform inspections with this procedure are responsible to follow all steps in this procedure.

3.0 Definitions

Bung hole: a threaded hole in the flammable cabinet that penetrates the wall for access to venting the cabinet. If closed, a metal plug is threaded into the hole opening.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP	NUMBER HP-75300
	REVISION Final Rev0
	DATE 08/05/08
	PAGE 2 of 10
Subject: Flammable Storage Cabinet Inspections	

Combustible Liquid: A liquid having a flash point at or above 100°F (37.8°C). Subdivided as follows:

- Class II liquids include those having flash points at or above 37.8°C (100°F) and below 60°C (140°F).
- Class IIIA liquids include those having flashpoints at or above 60°C (140°F) and below 93°C (200°F).
- Class IIIB liquids include those having flash points at or above 93°C (200°F).

Flammable Liquid: A liquid having a flash point below 100°F (37.8°C) and having a vapor pressure not exceeding 40 lb. per sq. in. (absolute) (2068 mm Hg) at 100°F (37.8°C). Class I liquids are subdivided as follows

- Class IA includes those having flash below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).
- Class IB includes those having flash points below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).
- Class IC includes those having flash points below 73°F (22.8°C) and below 100°F (37.8°C).

Flammable Solid: A substance that is:

- Thermally unstable and can undergo a strongly exothermic decomposition even without participation of oxygen;
- Readily combustible and can cause fire through friction, such as matches;
- Any material with a burning rate faster than 2.2 mm (0.087 in) per second;
- Any metal powder that can be ignited and react over the whole length of a sample in 10 minutes or less.

Locking mechanism (3-point): a closure mechanism on a cabinet door that latches on the bottom, top and middle of the door.

Oxidizer: A material that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases. A chemical defined as an oxidizer in NFPA 45, 49 or 325, by a DOT Placarded “Oxidizer”, by a NFPA/HMIS Label “OXY”, or with a manufacturer label of *Oxidizer*. ”

Room Types:

Laboratory – A work space specifically used to conduct research that meets the criteria for a “Lab Standard” area in the *Working with Chemicals* Subject Area.

Shop – A space used for fabrication (e.g., trades shop, tech shop). They may or may not

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP	NUMBER HP-75300
	REVISION Final Rev0
	DATE 08/05/08
	PAGE 3 of 10
Subject: Flammable Storage Cabinet Inspections	

contain chemicals. (A subset of an industrial area)

Industrial – An area where chemicals are handled that is not used for shop fabrication and is not a laboratory. These areas may have “manufacturing” activities, or be a support rooms for laboratories and shops such as a mechanical room. They may or may not contain chemicals.

Hallway – A passageway that is used to egress rooms.

4.0 Prerequisites

4.1 Training prior to using this procedure:

- 4.1.1 Demonstration of proper use of the procedure per Section 7.
- 4.1.2 Training for hazards other than those associated with chemicals may be needed for entry into areas where this inspection is required (check with ESH Coordinator or FS Representative for the facility).
- 4.1.3 Supplementary training: BNL Laboratory Standard, BNL Hazard Communication, and BNL Chemical Protective Clothing Training.

4.2 Access:

- 4.2.1 Contact the appropriate ES&H Coordinator or Principle Investigator before entering a Chemical Laboratory.
- 4.2.2 Use appropriate PPE for area.

4.3 Radiological Access:

- 4.2.1 Contact the appropriate Facility Support Representative or Technician to obtain approval to enter radiological areas.
- 4.2.2 Verify with the appropriate Facility Support Representative or Technician if a Radiological Work Permit is needed or is in effect. If so, review and sign the permit.
- 4.2.3 Use appropriate PPE for area.

5.0 Precautions

- 5.1 The actual task of conducting an inspection may cause significant employee health risks if an unacceptable storage condition is found. All safety measures of SOP must be followed.
 - 5.1.1 Peroxide crystals: Do not touch containers of peroxide forming chemicals if crystals are visible in the solution or at the lid. (See SBMS [Working with Chemicals](#) Exhibit [Storing Materials That Might Become Hazardous During Prolonged Storage.](#))

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP	NUMBER HP-75300
	REVISION Final Rev0
Subject: Flammable Storage Cabinet Inspections	DATE 08/05/08
	PAGE 4 of 10

5.1.2 **Flammable Solids:** Do not touch containers of flammable solids that are not under oil or under an inert atmosphere.

5.2 **Personal Protective Equipment:** Use appropriate personal protective equipment to protect the person performing the inspection:

- **Hand:** Use of disposable gloves. Exam-style, splash gloves of Nitrile, PVC, or Natural Rubber are acceptable.
- **Body:** Use cotton lab coats for inspections. Do not use disposable lab coats that are combustible. If personal clothing items (such as pants) become contaminated, they must be surrendered for BNL cleaning or disposal.
- **Foot:** Use fully enclosed footwear. Use steel toed shoes where required. If personal shoes become contaminated, they must be surrendered for BNL cleaning or disposal.
- **Respiratory:** Under normal use, respiratory protection is not required. If chemical or radiological levels are likely to exceed the OSHA, ACGIH, or DOE standards, do not conduct the inspection. Stop and consult the BNL IH Program Manager.
- **Eye:**
 - Use Safety Glasses with side shields for initial observations.
 - Use chemical splash goggles for the handling of corrosive chemicals including acids and bases.
 - When hazardous chemicals can significantly injure the face, use a full face shield with chemical splash goggles.

5.3 **Work Planning:** This procedure serves as the work authorization for inspections. However, all requirements of work permits and work planning system reviews for the area must be met in performing this procedure.

5.4 **Environmental Impact and Waste Disposal:** Inspections do not have adverse impact on the environment or create waste for disposal.

5.5 **Job Risk Assessment:** Consult the *Job Risk Assessment* SHSD-JRA-18 for the risk analysis of this operation based on the hazards and controls of this SOP.

6.0 **Procedure**

6.1 **Equipment:**

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP	NUMBER HP-75300
	REVISION Final Rev0
Subject: Flammable Storage Cabinet Inspections	DATE 08/05/08
	PAGE 5 of 10

- Secondary Containment Tray(s), as needed.
- PPE (gloves, lab coat, safety glasses, goggles, face shield, enclosed shoes as described in Section 5).
- Attachment 9.1: *Flammable Cabinet Inspection Form*

6.2 **Safety Precautions:**

- 6.2.1 Don the required PPE described in Section 5 prior to entering inspection areas and opening cabinets.
- 6.2.2 When opening a flammable cabinet door, do not stand directly in front of the cabinet. Allow 30 seconds before placing your head near the cabinet to avoid inhalation of any accumulated vapors.
- 6.2.3 Use visible signs and odor for indications that chemical containers are not intact. Stop if spillage is seen or smelled. Go to Step 6.6.
- 6.2.4 Keep the containers in the cabinet whenever possible. If a container must be removed from the flammable cabinet, move it to a secondary containment tray.

6.3 Record the location and ownership of the cabinet on top of the Attachment 9.1.

6.4 Inspect the status of the design and condition of the cabinet and record on Attachment 9.1:

- 6.4.1 Observe if the cabinet is properly certified (label).
- 6.4.2 Visually examine the outside of the flammable cabinet for any indications of problems, such as dents, rust, or penetrations.
- 6.4.3 Inspect the working of the latch,
- 6.4.4 Record the status of seal & bung holes and venting

6.5 Inspect the status of the contents of the cabinet with regards to volume, types of chemicals, storage, and compatibility issues and record on Attachment 9.1:

- 6.5.1 Visually examine the cabinet for broken bottles, spills, over pressurized containers, mists, or vapors. If on initial observation or while work progresses any improper condition exists, STOP and go to Step 6.6.
- 6.5.2 Examine chemical containers in the cabinet for proper labeling
- 6.5.3 Record the types of containers in the cabinet.
- 6.5.4 Observe if oxidizers are stored in the cabinet. Refer to NFPA 45, 49, and 325 to identify BNL oxidizers. (see SBMS [Working with Chemicals](#) Exhibit [Storing Materials That Might Become Hazardous During Prolonged Storage.](#))
- 6.5.5 Observe if non-flammable or combustible chemicals/materials are stored in a flammable cabinet.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP	NUMBER HP-75300
	REVISION Final Rev0
	DATE 08/05/08
	PAGE 6 of 10
Subject: Flammable Storage Cabinet Inspections	

6.6 **Actions to take on discovery of improper storage or an emergency:**

6.6.1 If there is a chemical spill in the cabinet, close the cabinet and notify the line organization and ensure the spill is addressed immediately. Depending on the severity/size of the spill, call x2222 and report the spill for cleanup. Do not perform a cleanup of the spill yourself.

6.6.2 If a chemical container is physically compromised (e.g. severely rusted, unlabeled, residues at cap, cap damaged, etc.) have the container owner move it to a secondary containment tray and place it in a fume hood until the situation can be remedied. If the occupants/owner of the area/cabinet is not present, immediately inform the ESH Coordinator and Building Manager about the issue.

6.6.3 Have the container owner remove all oxidizers from the cabinet and place them in proper secondary containment in an appropriate area. If the occupants/owner of the area/cabinet is not present, inform the ESH Coordinator and Building Manager about the issue.

6.7 Documenting Sampling Data: Use the *Flammable Cabinet Inspection Form* (Attachment 9.1), or equivalent, to record the inspection.

6.8 Ensure that a copy of the inspections report is sent to the BNL Chemical Hygiene Officer and is included in the ESH Directorate Recordkeeping system.

7.0 Implementation and Training

7.1 Document training using Attachment 9.2, the Job Performance Measure Completion Certificate. Qualification on this JPM is required on a 3 year basis.

7.2 Review Job Risk Inspection SHSD-JRA-18.

8.0 References

8.1 NFPA 45 Standard on Fire Protection for Laboratories Using Chemicals

8.2 NFPA 49: Hazardous Chemical Data

8.3 NFPA 325: Fire hazard Properties of Flammable Liquids, Gases, and Volatile Solids

8.4 Micromedex Database <http://csi.micromedex.com>.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP		NUMBER HP-75300
		REVISION Final Rev0
Subject: Flammable Storage Cabinet Inspections		DATE 08/05/08
		PAGE 7 of 10

9.0 Attachments

- 9.1 *Flammable Cabinet Inspection Form*
- 9.2 Job Performance Measure: Qualification record

10.0 Documentation

Document Development		
PREPARED BY: <i>(Signature and date on file)</i> Ken Erickson, CHO Date: 07/23/08	REVIEWED BY: Team Review on 07/29/08 <i>(Signature and date on file)</i> J. Peters Date: 08/04/08	APPROVED BY: <i>(Signature and date on file)</i> R. Selvey IH Manager Date: 08/05/08
ESH Coordinator/ Date: <i>none</i>	Work Coordinator/ Date: <i>none</i>	SHSD Manager / Date <i>none</i>
QA Representative / Date: <i>none</i>	Training Coordinator / Date: <i>none</i>	Filing Code: IH52
Facility Support Rep. / Date: <i>none</i>	Environ. Compliance Rep. / Date: <i>none</i>	Effective Date: 08/05/08
ISM Review - Hazard Categorization <input type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low/Skill of the craft	Validation: <input type="checkbox"/> Formal Walkthrough <input checked="" type="checkbox"/> Desk Top Review <input type="checkbox"/> SME Review Name / Date: 07/29/08	Implementation: Training Completed: Tracked in BTMS Procedure posted on Web: 08/05/08 Hard Copy files updated: n/a Document control: 08/05/08

Revision Log
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above Section/page and Description of change: Reviewer/Date:

Environmental, Safety, Health Directorate-
SHSD Industrial Hygiene Group

Flammable Cabinet Inspection Form

Organization:	Building:	Room/Area:
Location of Cabinet (e.g., NW Corner of Room):		
Cabinet Owner's Name:		
Room Type: <input type="checkbox"/> Laboratory <input type="checkbox"/> Shop <input type="checkbox"/> Industrial <input type="checkbox"/> Hallway <input type="checkbox"/> Other:		
Inspection By:	Date:	Inspection #

1. Cabinet Design	
1.1. <input type="checkbox"/> Labeled "Flammable"	<input type="checkbox"/> Label defaced <input type="checkbox"/> Not labeled
1.2. <input type="checkbox"/> Labeled "Meets NFPA 30"	<input type="checkbox"/> Label defaced <input type="checkbox"/> Not labeled
1.3. <input type="checkbox"/> Other Approval Designation:	<input type="checkbox"/> Labeled "Meets OSHA Requirements" <input type="checkbox"/> Labeled "UL Approved" <input type="checkbox"/> Other:
1.4. <input type="checkbox"/> 3-point locking mechanism	<input type="checkbox"/> Not present in the design <input type="checkbox"/> Not working smoothly or broken
1.5. <input type="checkbox"/> Non-approved design	<input type="checkbox"/> File Cabinet <input type="checkbox"/> Storage Cabinet <input type="checkbox"/> Other:
1.6. <input type="checkbox"/> Venting & Condition	<input type="checkbox"/> Bung Sealed <input type="checkbox"/> Bung Open <input type="checkbox"/> Vented <input type="checkbox"/> Unacceptable overall condition of cabinet.

2. Cabinet Contents	
2.1. Quantity of Containers	# of Containers: <input type="checkbox"/> 1-25 <input type="checkbox"/> 25-50 <input type="checkbox"/> 50-100 <input type="checkbox"/> 100+
	Total Liters: <input type="checkbox"/> 1-25 <input type="checkbox"/> 25-50 <input type="checkbox"/> 50-100 <input type="checkbox"/> 100+
2.2. <input type="checkbox"/> Flammable Liquids	<input type="checkbox"/> Glass Bottles <input type="checkbox"/> Plastic Bottles <input type="checkbox"/> Metal Cans
2.3. <input type="checkbox"/> Aerosol Cans	<input type="checkbox"/> Paint <input type="checkbox"/> Solvent/Cleaner <input type="checkbox"/> Air <input type="checkbox"/> Other:
2.4. <input type="checkbox"/> Compressed Gas cylinder or lecture bottle	<input type="checkbox"/> Label defaced <input type="checkbox"/> No label Chemical Name:
2.5. <input type="checkbox"/> Flammable Solid	Chemical Name:
2.6. <input type="checkbox"/> Oxidizer	<input type="checkbox"/> NFPA 45, 49 or 325 listed <input type="checkbox"/> Mfr. labeled: "Oxidizer" <input type="checkbox"/> DOT Placard "Oxidizer" <input type="checkbox"/> Bleach <input type="checkbox"/> NFPA/HMIS Label "OXY" <input type="checkbox"/> Other:
2.7. <input type="checkbox"/> Combustible Liquid or Solid	Chemical Name:
2.8. <input type="checkbox"/> Nonflammable/noncombustible liquid or solid (including paper)	<input type="checkbox"/> Cardboard <input type="checkbox"/> Other:

3. Storage Conditions (unacceptable)	
3.1. <input type="checkbox"/> Leaking, corroded container	Describe (chemical & condition):
3.2. <input type="checkbox"/> Cap Damaged	Describe (chemical & condition):
3.3. <input type="checkbox"/> Label Damaged on Container	<input type="checkbox"/> Label defaced <input type="checkbox"/> No label Chemical Name:



HP-IHP-75300

Environmental, Safety, Health Directorate-
SHSD Industrial Hygiene Group

Flammable Cabinet Inspection Form

Item#	Corrective Actions Taken

Comments

Flammable Cabinet Inspection – Hazard Evaluator Job Performance Measure (JPM) Completion Certificate

Candidate's Name	Life Number:
------------------	--------------

Practical Skill Evaluation: Preparation and Preliminary steps

Criteria	Qualifying Performance Standard	Unsat.	Recov.	Satisf.
1. Hazard Analysis	Understands the need to be aware of hazard of chemical storage areas and potential exposure to the self as assessor and workers in the area.			
2. Personal Protective Equipment	Understands the need to be aware of the potential surface contamination, airborne levels of contaminants, radiological hazards, and noise hazard. Knows the proper PPE.			

Practical Skill Evaluation: Inspection Process & Parameters

Criteria	Qualifying Performance Standard	Unsat.	Recov.	Satisf.
1. Inspection parameter-cabinet design	Demonstrates knowledge of what constitutes proper design and labeling of a flammable cabinet			
2. Inspection parameter-cabinet condition	Demonstrates the ability to verify that the cabinet is operational and in proper condition.			
3. Inspection parameter-flammable materials	Demonstrates knowledge of what constitutes a flammable material that is allowed in a flammable storage cabinet. Knows the source of information used at BNL.			
4. Inspection parameter-Unacceptable materials	Demonstrates knowledge of what constitutes an unacceptable material in a flammable cabinet: such as combustible and oxidizers			
5. Container Labeling	Describes the acceptable container labeling conditions. Describes the proper actions to take if not properly labeled.			
6. Emergency Actions	Describes the proper actions to take if an unacceptable storage, damaged containers, or spillage is found or occurs during the inspection			
7. Documentation	Demonstrates correctly filling out Inspection form. Describes the process to notify workers and management of any unacceptable results or conditions.			

I accept the responsibility for performing this task as demonstrated within this JPM and the corresponding SOP.

Candidate Signature:	Date:
----------------------	-------

I certify the candidate has satisfactorily performed each of the above listed steps and is capable of performing the task unsupervised.

Evaluator Signature:	Date:
----------------------	-------